

**APPARATUS AND METHOD FOR TIMEOUT-FREE WAITING FOR AN  
ORDERED MESSAGE IN A CLUSTERED COMPUTING ENVIRONMENT**

**ABSTRACT OF THE DISCLOSURE**

5 A clustered computer system includes multiple computer systems (or nodes) on a  
network that can become members of a group to work on a particular task, referred to  
herein as a protocol. A protocol is defined so that each phase of the protocol is  
terminated with an acknowledge (ACK) round. Within each phase of the protocol, a node  
cannot both send and receive a data message. The protocol includes an ACK round that  
provides a relative time event that indicates when a data message should be received. If  
10 the data message is not received when the ACK round occurs, the receiver knows that the  
sender did not send it, and can request that the sender re-send the missing data message.  
In a first embodiment, referred to herein as the "post-ACK" case, the receipt of expected  
data messages is checked after the ACK round occurs. In a second embodiment, referred  
to herein as the "pre-ACK" case, the receipt of expected data messages is checked before  
15 the ACK round occurs. In both cases, when the receiver sees the ACK round, it knows  
that the sender sent the data message. If the data message was not received by the  
receiver, it knows to request that the sender re-send the data message. In this manner the  
preferred embodiments provide an architected way for sending and receiving data  
messages without using timers in a clustered computing environment that includes  
20 ordered messages. As a result, the preferred embodiments may be readily implemented  
on computer clusters that include nodes on a wide area network (WAN) that have a large  
variability in their response times.